Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for bidirectional data communication over a non-ideal transmission channel, comprising:

evaluating a channel response characteristic of a single QAM channel with respect to a transmission signal parametric set, the channel response characteristic comprising a bit error rate and a signal-to-noise ratio and the transmission signal parametric set comprising a constellation size and a ~~spectral allocation~~ single carrier having an adjustable center frequency;

varying said ~~transmission signal parametric set~~ adjustable center frequency by varying a stop frequency of ~~the~~ spectral allocation while maintaining a substantially constant start frequency of the spectral allocation so as to determine a maximum spectral allocation at which communication can occur without exceeding a predetermined signal-to-noise ratio;

re-evaluating said channel response characteristic with respect to said varied ~~transmission signal parametric set~~ center frequency; and

defining an optimal ~~transmission signal parametric set~~ constellation size and optimal center frequency for which the channel response characteristic allows optimization of at least one of a bit rate and a noise margin.

2.-4. (Cancelled)

5. (Currently Amended) The method according to claim 1~~,~~ ~~wherein the step of varying said transmission signal parametric set~~ further ~~comprises~~ comprising varying the constellation size by encoding a signal in conformance with a plurality of discrete constellation sizes so as to determine a maximum constellation size at which single QAM communication can occur without exceeding a predetermined bit error rate.

6. (Original) The method according to claim 5, wherein the step of varying the constellation size further comprises:

varying the constellation size while maintaining a substantially constant spectral allocation; and

repeating the constellation size varying step at a plurality of different discrete spectral allocations.

7. (Currently Amended) The method according to claim 1, wherein the step of varying said ~~transmission signal parametric set~~ adjustable center frequency comprises

varying the spectral allocation while maintaining a constant constellation size; and

repeating the ~~spectral allocation~~ center frequency varying step for a plurality of different discrete constellation sizes.

8. (Previously Presented) A method for providing digital communication via twisted pair telephone lines and the like, the method comprising the steps of:

defining a frequency spectrum having a predetermined bandwidth within which communication between two transceivers is

to be performed, the frequency spectrum comprising a beginning (Fstart) at a low frequency end thereof and an end (Fstop) at a high frequency end thereof;

defining a single QAM channel within the frequency spectrum, the single QAM channel having an initial bandwidth which is less than the bandwidth of the frequency spectrum;

communicating via the single QAM channel while varying the spectral allocation of the single QAM channel and while maintaining a constant constellation size;

determining a potential bit rate for each of a plurality of the spectral allocations at which communication was performed, the potential bit rate being determined using a potential constellation size for each spectral allocation determined via at least one of the measured signal to noise ratio (SNR) for that spectral allocation, a desired minimum signal to noise ratio (SNR) margin, and a given overall target bit rate;

selecting a spectral allocation having a highest one of the potential bit rates;

communicating while using the selected spectral allocation at its corresponding potential constellation size;

determining a value of a channel quality criteria;

continuing to communicate using the selected spectral allocation at its corresponding potential constellation size when the channel quality criteria indicates that the quality of the channel is above a predetermined threshold; and

reducing the constellation size to a new constellation size and determining the potential bit rate for the current spectral allocation and new constellation size when the channel quality

criteria indicates that the channel quality criteria is below a predetermined threshold, then selecting a new spectral allocation having a highest one of the potential bit rates and repeating the previous three steps and this step until the channel quality criteria indicates that the channel quality is no longer below the predetermined threshold for the selected spectral allocation, the communicating step being performed with other than the maximum constellation size, when other than the maximum constellation size will result in the maximum potential bit rate and an acceptable channel quality criteria.

9. (Previously Presented) The method as recited in claim 8, wherein the step of defining the single QAM channel within the frequency spectrum comprises defining two channels within the frequency spectrum to facilitate full duplex communication.

10. (Previously Presented) The method as recited in claim 8, wherein the step of defining the single QAM channel within the frequency spectrum comprises defining a single downstream QAM channel and a single upstream QAM channel within the frequency spectrum.

11. (Previously Presented) The method as recited in claim 8, wherein the step of defining the single QAM channel within the frequency spectrum comprises defining a single upstream QAM channel proximate the beginning (FSstart) of the frequency spectrum and defining a single downstream QAM channel

proximate the single upstream QAM channel, the single downstream QAM channel being formed within a higher frequency portion of the frequency spectrum than the single upstream QAM channel.

12. (Previously Presented) The method as recited in claim 8, wherein the step of defining the single QAM channel within the frequency spectrum comprises defining a single downstream QAM channel proximate the beginning (FSstart) of the frequency spectrum and defining a single upstream QAM channel proximate the single downstream QAM channel, the single upstream QAM channel being formed within a higher frequency portion of the frequency spectrum than the single downstream QAM channel.

13. (Previously Presented) The method as recited in claim 8, wherein the step of communicating via the single QAM channel while varying the spectral allocation of the single QAM channel comprises varying the spectral allocation of the single QAM channel among a finite number of predetermined spectral allocations.

14. (Previously Presented) The method as recited in claim 8, wherein the step of communicating via the single QAM channel while varying the spectral allocation of the single QAM channel comprises varying the spectral allocation among 9 different predetermined spectral allocations.

15. (Previously Presented) The method as recited in claim 8, wherein the step of communicating via the single QAM

channel while varying the spectral allocation of the single QAM channel comprises sweeping the bandwidth between a minimum bandwidth and a maximum bandwidth.

16. (Previously Presented) The method as recited in claim 8, wherein the step of communicating via the single QAM channel while varying the spectral allocation of the single QAM channel comprises varying the bandwidth of the single QAM channel without varying a starting frequency (Fstart) of the single QAM channel.

17. (Previously Presented) The method as recited in claim 8, wherein the step of communicating via the single QAM channel while varying the spectral allocation of the single QAM channel comprises using quadrature phase shift keying (QPSK) to effect communication.

18.-19. (Cancelled)

20. (Original) The method as recited in claim 8, further comprising the step of defining a tabulation of the potential bit rates.

21. (Previously Presented) The method for providing digital communication as recited in claim 8, further comprising the step of establishing a default communication link between two transceivers prior to the step of communicating via the

single QAM channel while varying the spectral allocation of the single QAM channel.

22. (Original) The method for providing digital communication as recited in claim 21, wherein the step of establishing the default link comprises establishing a default link using pre-established communication parameters.

23. (Original) The method for providing digital communication as recited in claim 21, wherein the step of establishing the default link comprises establishing a full duplex default link.

24. (Previously Presented) The method for providing digital communication as recited in claim 21, wherein the step of establishing the default link comprises establishing a single upstream and a single downstream QAM channel, each of the single upstream and the single downstream QAM channels comprising a separate portion of the frequency spectrum.

25. (Previously Presented) The method for providing digital communication as recited in claim 21, wherein the step of establishing the default link comprises the steps of:

establishing a single upstream QAM channel proximate the beginning (FSstart) of the frequency spectrum, the single upstream QAM channel having a pre-defined bandwidth;

establishing a default downstream channel proximate the upstream channel, the downstream channel having a predetermined bandwidth; and

wherein the sum of the bandwidths of the upstream channel and the downstream channel is less than the bandwidth of the frequency spectrum so as to facilitate expansion of the downstream channel.

26. (Original) The method for providing digital communication as recited in claim 21, wherein the step of establishing the default link comprises the steps of:

establishing a downstream channel proximate the beginning (FSstart) of the frequency spectrum, the downstream channel having a pre-defined bandwidth;

establishing a default upstream channel proximate the downstream channel, the upstream channel having a predetermined bandwidth; and

wherein the sum of the bandwidths of the downstream channel and the upstream channel is less than the bandwidth of the frequency spectrum so as to facilitate expansion of the upstream channel.

27. (Original) The method for providing digital communication as recited in claim 21, further comprising the step of designating one of the two transceivers as a master transceiver and the other of the two transceivers as a slave transceiver so as to facilitate initialization of the default link without contention.

28. (Original) The method for providing digital communication as recited in claim 21, further comprising the step of using a contention routine to mitigate contention during initialization of the default link.

29. (Cancelled)

30. (Previously Presented) The method for providing digital communications as recited in claim 8, wherein the channel quality criteria comprises a bit error rate (BER).

31-40. (Cancelled)

41. (Currently Amended) A method for enhancing a bit rate and/or margin at which quadrature amplitude modulated (QAM) communication is performed, the method comprising the steps of:

varying a ~~spectral allocation~~ center frequency and constellation size of a single QAM channel with which communication is performed, wherein the ~~spectral allocation~~ center frequency is varied by varying a start frequency and a stop frequency thereof; and

defining a combination of the ~~spectral allocation~~ center frequency and the constellation size at which bit rate and/or margin is enhanced.

42. (Currently Amended) The method as recited in claim 41, wherein the step of varying the s ~~spectral allocation~~ center

frequency comprises varying the start frequency and the stop frequency in discrete increments.

43. (Currently Amended) The method as recited in claim 41, wherein the step of varying the ~~spectral allocation~~ center frequency comprises sweeping the start frequency and the stop frequency in a continuous manner.

44. (Currently Amended) The method as recited in claim 41, wherein the step of varying the constellation size comprises utilizing a plurality of different constellation sizes so as to determine a maximum constellation size at which communication can occur.

45. (Previously Presented) The method as recited in claim 41, wherein the step of varying the constellation size comprises utilizing a plurality of different constellation sizes so as to determine a maximum constellation size at which communication can occur without exceeding a predetermined bit error rate (BER).

46. (Currently Amended) The method as recited in claim 41, wherein the step of varying the ~~spectral allocation~~ center frequency and the constellation size comprises varying the constellation size while maintaining a constant ~~spectral allocation~~ center frequency and repeating this step for a plurality of different ~~spectral allocations~~ center frequencies.

47. (Currently Amended) The method as recited in claim 41, wherein the step of varying the ~~spectral allocation~~ center frequency and the constellation size comprises varying the ~~spectral allocation~~ center frequency while maintaining a constant constellation size for a plurality of different constellation sizes.

48. (Previously Presented) A method for enhancing quadrature amplitude modulated (QAM) communications, the method comprising the steps of:

varying a spectral allocation and constellation size of a single QAM channel with which communication is performed, wherein the spectral allocation is varied by varying a stop frequency thereof while maintaining a constant start frequency thereof, so as to mitigate high frequency content of the spectral allocation, wherein varying the spectral allocation further comprises varying a symbol rate and a center frequency of the single QAM channel; and

defining a combination of the spectral allocation and the constellation size at which bit rate is enhanced when the target bit rate cannot be achieved and defining a combination of the spectral allocation and the constellation size at which margin is enhanced when the target bit rate is achieved.

49. (Previously Presented) A method for enhancing quadrature amplitude modulated (QAM) communications, the method comprising the steps of:

varying a spectral allocation and constellation size of a single QAM channel with which communication is performed, wherein the spectral allocation is varied by varying a stop frequency thereof while maintaining a constant start frequency thereof, so as to mitigate high frequency content of the spectral allocation, wherein varying the spectral allocation further comprises varying a symbol rate and a center frequency of the single QAM channel; and

defining a combination of the spectral allocation and the constellation size at which bit rate is enhanced while providing at least one of a minimum margin and a maximum bit error rate.

50. (Previously Presented) A method for enhancing quadrature amplitude modulated (QAM) communications, the method comprising the steps of:

varying a spectral allocation and constellation size of a single QAM channel with which communication is performed, wherein the spectral allocation is varied by varying a stop frequency thereof while maintaining a constant start frequency thereof, so as to mitigate high frequency content of the spectral allocation, wherein varying the spectral allocation further comprises varying a symbol rate and a center frequency of the single QAM channel; and

defining a combination of the spectral allocation and the constellation size at which margin is enhanced while providing a desired bit rate.

51. (Previously Presented) A method for enhancing quadrature amplitude modulated (QAM) communications, the method comprising the steps of:

varying a spectral allocation and constellation size of a single QAM channel with which communication is performed, wherein the spectral allocation is varied by varying a stop frequency thereof while maintaining a constant start frequency thereof, so as to mitigate high frequency content of the spectral allocation, wherein varying the spectral allocation further comprises varying a symbol rate and a center frequency of the single QAM channel; and

defining a combination of the spectral allocation and the constellation size at which a desired bit rate is achieved and margin is maximized.

52. (Previously Presented) A method for enhancing quadrature amplitude modulated (QAM) communications, the method comprising the steps of:

varying a spectral allocation and constellation size of a single QAM channel with which communication is performed, wherein the spectral allocation is varied by varying a stop frequency thereof while maintaining a constant start frequency thereof, so as to mitigate high frequency content of the spectral allocation, wherein varying the spectral allocation further comprises varying a symbol rate and a center frequency of the single QAM channel; and

defining a combination of the spectral allocation and the constellation size at which bit rate is enhanced when a target

bit rate cannot be achieved and defining a combination of the spectral allocation and the constellation size of which bit error rate is reduced when the target bit rate is achieved.

53. (Previously Presented) A method for enhancing quadrature amplitude modulated (QAM) communications, the method comprising the steps of:

varying a spectral allocation and constellation size of a single QAM channel with which communication is performed, wherein the spectral allocation is varied by varying a stop frequency thereof while maintaining a substantially constant start frequency thereof, so as to mitigate high frequency content of the spectral allocation, wherein varying the spectral allocation further comprises varying a symbol rate and a center frequency of the single QAM channel; and

defining a combination of the spectral allocation and the constellation size at which bit error rate is minimized while providing a desired bit rate.

54. (Previously Presented) A method for enhancing quadrature amplitude modulated (QAM) communications, the method comprising the steps of:

varying a spectral allocation and constellation size of a single QAM channel with which communication is performed, wherein the spectral allocation is varied by varying a stop frequency thereof while maintaining a substantially constant start frequency thereof, so as to mitigate high frequency content of the spectral allocation, wherein varying the spectral

allocation further comprises varying a symbol rate and a center frequency of the single QAM channel; and

defining a combination of the spectral allocation and the constellation size at which a desired bit rate is achieved and bit error rate is minimized.

55. (Previously Presented) A bidirectional data communication device of the type in which spectrum allocation and constellation size are communication parameters, comprising:

a transmitter portion including:

an encoder coupled to encode digital data transmissions of a single QAM channel;

a modulator coupled to modulate encoded digital data transmissions of the single QAM channel;

a digital to analog converter coupled to convert modulated digital data transmissions into analog data transmissions;

an electronic hybrid coupled to separate received analog data from transmitted analog data;

a receiver portion including:

an analog to digital converter coupled to convert the received analog data into digital data;

a demodulator coupled to demodulate received digital data;

a decoder coupled to decode demodulated received digital data;

a transmit spectrum control coupled to vary a spectrum allocation of the single QAM channel, wherein the spectral

allocation is varied by varying a symbol rate and a center frequency of the single QAM channel, with which the encoder encodes the digital data transmissions and with which the modulator modulates the encoded digital data transmissions; and

a transmit constellation size control coupled to vary the constellation size with which the encoder encodes digital data transmissions of the single QAM channel.

56. (Previously Presented) A bidirectional data communication device of the type in which spectrum allocation and constellation size are communication parameters, comprising:

a transmitter portion including:

an encoder coupled to encode digital data transmissions of a single QAM channel;

a modulator coupled to modulate encoded digital data transmissions of the single QAM channel;

a digital to analog converter coupled to convert modulated digital data transmissions into analog data transmissions;

an electronic hybrid coupled to separate received analog data from transmitted analog data;

a receiver portion including:

an analog to digital converter coupled to convert the received analog data into digital data;

a demodulator coupled to demodulate received digital data;

a decoder coupled to decode demodulated received digital data;

a receive spectrum control coupled to vary a spectrum allocation of the single QAM channel, wherein the spectral allocation of the single QAM channel is varied by varying a symbol rate and a center frequency of the single QAM channel, with which the demodulator demodulates the received digital data and with which the decoder decodes the demodulated received digital data; and

a receive constellation size control coupled to vary a constellation size with which the decoder decodes demodulated received digital data of the single QAM channel.

57. (Previously Presented) The method as recited in claim 8, wherein the spectral allocation of the single QAM channel is varied by varying a symbol rate and a center frequency of the single QAM channel.

58. (Previously Presented) The method as recited in claim 57, wherein the symbol rate and the center frequency are varied simultaneously.

59-60. (Cancelled)

61. (Previously Presented) The method as recited in claim 41, wherein the start frequency and the stop frequency are varied by varying a symbol rate and a center frequency of the single QAM channel.

62. (Previously Presented) The method as recited in claim 61, wherein the symbol rate and the center frequency are varied simultaneously.

63. (Previously Presented) The method as recited in claim 55, wherein the symbol rate and the center frequency are varied simultaneously.

64. (Previously Presented) The method as recited in claim 56, wherein the symbol rate and the center frequency are varied simultaneously.